**Motion: Investigating Distance, Displacement, Speed and Velocity**

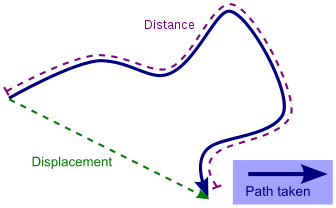
Your task, in a group of 3 or 4, is to map out a course around the school. Individuals in your group will be timed whilst travelling this course. From this activity, you will be required to work out values of distance, displacement, speed and velocity.

**Materials (per group):**

* Trundle wheel
* Stopwatch
* Pen
* School map (see over the page)

**Method:**

1. Using the trundle wheel, measure a course around the school and record it on your map. Use the guidelines below:
   * Your course must be between 100 and 200 metres

[](http://en.wikipedia.org/wiki/File:Distancedisplacement.svg)

* + You must stay within school grounds
  + Your course cannot include going into classrooms
  + In order to be able to calculate displacement you must be able to measure, in a straight line, from the starting position to the final position of your course, as shown on the right. If this line is through a building or other object, you will not be able to measure displacement.

1. Record the distance of your course in the table below. Remember to include the units.
2. Measure from the end point of your course to the starting point of your course **in a straight line** in order to find the displacement. Record this in the table below.
3. Choose one person from the group to travel your course. They must do so 2 times, each using a different form of locomotion. Choose 2 of the following examples: *walking, jogging, skipping, lunges, hopping.* Each time the person travels the course, you should record their time with the stopwatch and write it in the table below.
4. Return to your classroom and complete the questions below.

**Results:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mode of Locomotion** | **Distance of Course** | **Displacement of Individual** | **Time Taken** | **Average Speed** | **Average Velocity** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Discussion:**

1. Describe the distance between distance and displacement.
2. Calculate the average speed for each mode of locomotion using the formula *distance travelled/time taken*.
3. Calculate the average velocity for each mode of locomotion using the formula *displacement/time*.
4. Describe the difference between instantaneous speed and average speed.
5. Describe the difference between speed and velocity.

